

Supplementary Data

Table S1: Summary of Comparison between Patients with Greater or Less Than 4 hours/night Therapy Use at the Final Visit.

	Therapy \geq 4 hours/night at Final Visit	Therapy $<$ 4 hours/night at Final Visit
Parameter	Mean \pm SD (N) Or % (n/N)	Mean \pm SD (N) Or % (n/N)
Age at consent	60.6 \pm 10.3 (180)	56.2 \pm 12.5 (48)
Gender (% Female)	19.9% (36/181)	10.4% (5/48)
BMI at baseline	28.7 \pm 3.8 (178)	30.5 \pm 4.6 (47)
Baseline AHI	33.8 \pm 14.1 (180)	38.8 \pm 17.6 (48)
Baseline ESS	12.0 \pm 5.4 (163)	11.9 \pm 5.7 (42)
Tongue motion		
Right protrusion	20.7% (36/174)	20.0% (9/45)
Bilateral protrusion	70.1% (122/174)	73.3% (33/45)
Other	9.2% (16/174)	6.7% (3/45)
Change in AHI at post-titration visit	-23.7 \pm 14.9 (167)	-29.1 \pm 22.0 (46)
Change in ESS at post-titration visit	-5.7 \pm 5.3 (156)	-4.2 \pm 5.7 (40)
AHI Success at post-titration visit	82.4% (145/176)	80.4% (37/46)
Change in AHI at Final	-24.4 \pm 16.7 (186)	-27.5 \pm 18.4 (19)
Change in ESS at Final	-5.5 \pm 5.4 (176)	-4.3 \pm 6.1 (40)
AHI Success at Final	83.3% (155/186)	73.7% (14/19)
Improvement by CGI at post-titration visit	83.1% (138/166)	76.7% (33/43)
Patient satisfied or strongly satisfied at post-titration	94.5% (120/127)	91.2% (31/34)
Therapy use at post-titration	47.3 \pm 11.6 (170)	34.9 \pm 14.1 (44)
Therapy use \geq 28 hours at post-titration	94.1% (160/170)	75.0% (33/44)

SD = standard deviation; N = numbers; AHI = apnea-hypopnea index; ESS = Epworth Sleepiness Scale; CGI = clinical global impression; BMI = Body Mass Index (in kg/m²).

Table S2. Adverse Events at the Post-Titration and Final Visits in Severity.

Type	Post-Titration	Final Visit	Severity			Total
			Mild	Moderate	Severe	
Tongue Weakness	2	0	1	1	0	2
Swallowing or speech related	3	0	2	1	0	3
Discomfort (incision/scar)	5	5	6	3	1	10
Discomfort (device)	7	3	7	2	1	10
Infection	0	0	0	0	0	0
Post-Op – Other	8	3	11	0	0	11
Stimulation related discomfort	26	15	21	19	1	41
Tongue abrasion	7	7	9	4	1	14
Insomnia/Arousal	6	9	8	5	2	15
Revision interventions (including explant)	0	1	0	0	1	1
Other Discomfort	5	2	5	1	1	7
Activation - Other	18	16	23	10	1	34
Total	87	61	93	46	9	149

The table lists the number of patients for each event type at the different visits as well as the severity.

Table S3. List of All Reported Severe Adverse Events during the Post-Titration and Final Visit.

Visit	Event	Event - Specify	Severity
Post-Titration	Discomfort (incision/scar)	Right shoulder pain (Scarring)	Severe
Post-Titration	Discomfort (device)	Strain at stimulation electrode	Severe
Post-Titration	Insomnia/Arousal	Can't fall asleep again during therapy pauses if wakes up at night	Severe
Post-Titration	Other Discomfort	Strong electric shock	Severe
Post-Titration	Activation - Other	Hospitalized for bilateral pulmonary embolus felt unrelated to device	Severe
Final Follow-up	Stimulation related discomfort	Too strong at therapeutic level from last reprogram; therefore, not using it	Severe
Final Follow-up	Tongue abrasion	Tongue rubs on teeth	Severe
Final Follow-up	Insomnia/Arousal	Wakes up from tongue rubbing	Severe
Final Follow-up	Revision interventions	Inadequate therapeutic response, lack of tongue protrusion, revision cuff	Severe

Table S4. Registry centers, enrollment and investigators

Registry Centers,	Patient Enrolled	Investigators
Germany		
Technical University of Munich	96	Clemens Heiser, MD Benedikt Hofauer, MD Sabrina Wenzel, RN Katharina Eckbauer, RN
University Hospital of Schleswig-Holstein, Lubeck	87	Armin Steffen, MD Nicole Behn, RN
University ENT Clinic Mannheim	57	Joachim T Maurer, MD J Ulrich Sommer, MD Oliver Schmidt, RN
Registry Centers, United States		
Thomas Jefferson University and Hospital	74	Maurits Boon, MD Colin Huntley, MD Karl Doghramji, MD Beth Duddy, RN
University of Pittsburgh Medical Center	50	Ryan Soose, MD Patrick J. Stollo Jr., MD Courtney Chou, MD Tina Harrison, RN

University of Pennsylvania	41	Richard Schwab, MD Erica Thaler, MD Sarah Leinwand, BS Nadia Azad, BS
University of Alabama at Birmingham	24	Kirk Withrow, MD Lisa Clemons, RN
Cleveland Clinic Foundation	23	Tina Waters, MD Reena Mehra, MD Alan Kominsky, MD Douglas Trask, MD Harneet Walia, MD Joan Aylor, RN
University of Kansas Medical Center	16	Christopher Larsen, MD Suzanne Stevens, MD Damien Stevens, MD Jill Tuschhoff, RN Bryan Humphrey, RRT-NPS
University of Southern California	14	Eric Kezirian, MD Yeini Colombia Guardia, RN
University Hospital Cleveland	10	Kingman Strohl, MD Mark Weidenbecher, MD Mary Andrew, RN

Table S5: Surgical Times. There were 5 sites that participated in previous studies, which had surgical time on 290 patients, and 9 sites that were offering UAS for the first time, with data on 139 patients. There was no significant difference in the surgical time between the two groups. (p=0.65)

# entries with surgical time		Average Surgical Time (minutes)
Centers with previous UAS experience (n=5)	290	142.7 ± 41.9
Centers without previous UAS experience (n=9)	139	140.6 ± 50.7
p-value		0.65